

FIG.1

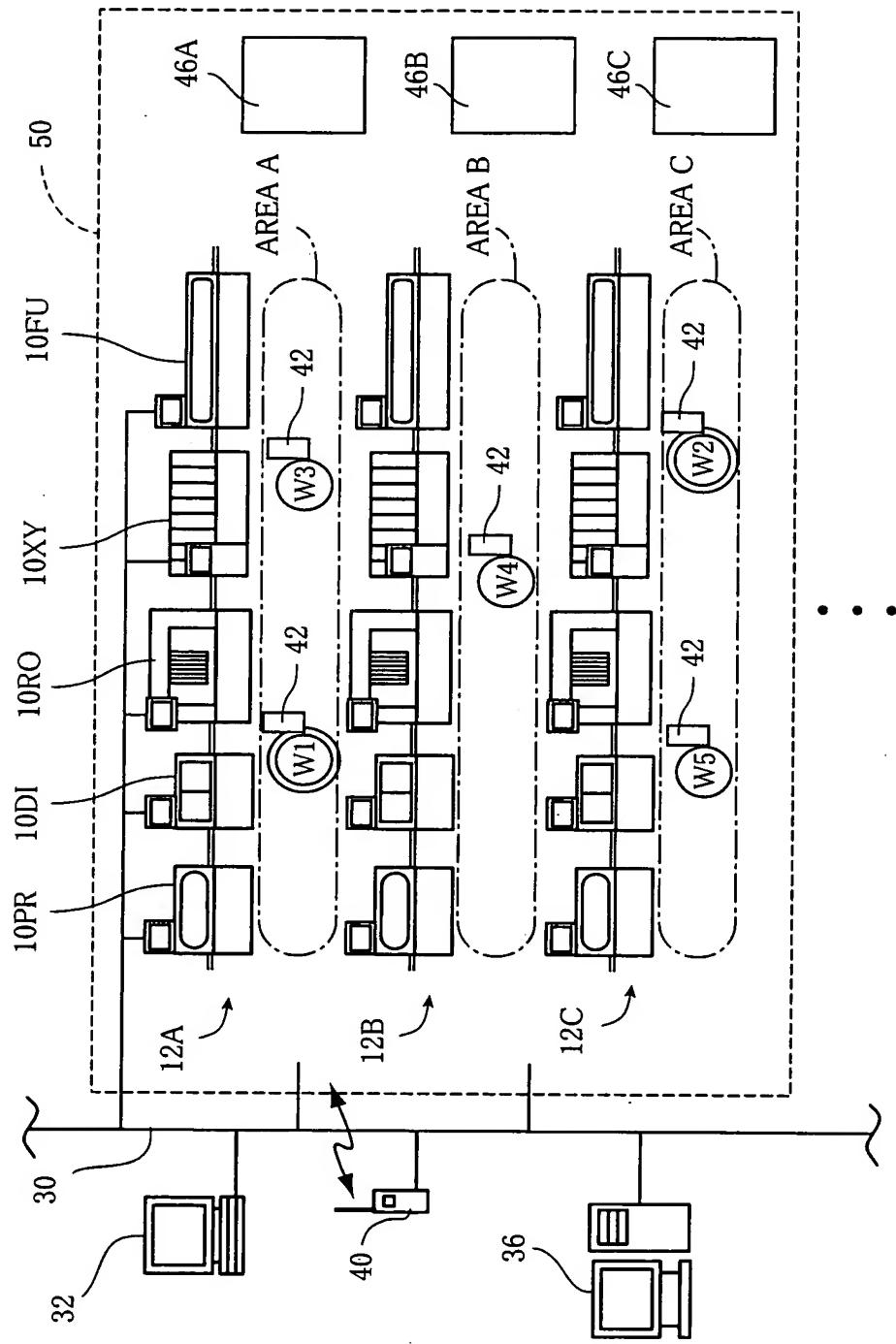


FIG.2

| (UNITS:SECONDS) | | | | | | | |
|--|------------|----------------------------|---------------------|--------------------|----------------------|-----------------------------|-------------------------|
| NAME OF WORK | SORT | OBJECTIVE MACHINE | STOPPING OF MACHINE | NEEDED SKILL LEVEL | STANDARD NEEDED TIME | ARRIVAL-TIME ADJUSTING TIME | PRIORITY ADJUSTING TIME |
| SOLDER SUPPLY | SUPPLYING | SCREEN-PRINTING MACHINE | YES | H | 180 | -30 | -30 |
| SYRINGE REPLACEMENT | SUPPLYING | ADHESIVE APPLYING MACHINE | YES | L | 150 | -30 | -30 |
| FEEDER REPLACEMENT RO | SUPPLYING | SCREEN-PRINTING MACHINE | NO | L | 30 | 0 | 60 |
| FEEDER REPLACEMENT XY | SUPPLYING | COMPONENT MOUNTING MACHINE | YES | L | 60 | -30 | -30 |
| REEL REPLACEMENT XY | SUPPLYING | COMPONENT MOUNTING MACHINE | NO | L | 40 | -120 | 60 |
| NOZZLE REPLACEMENT XY | RECOVERING | COMPONENT MOUNTING MACHINE | YES | H | 60 | - | - |
| IMAGE-RECOGNITION-CONDITION ADJUSTMENT | RECOVERING | COMPONENT MOUNTING MACHINE | YES | H | 300 | - | 0 |
| SOLDER-AMOUNT ADJUSTMENT | RECOVERING | SCREEN-PRINTING MACHINE | YES | H | 300 | - | 0 |
| HEATING-CONDITION ADJUSTMENT | RECOVERING | REFLOW FURNACE | YES | H | 300 | - | 0 |

FIG. 3

| WORKER No. | WORKER SKILL LEVEL | RESPONSIBILITY SECTION |
|------------|--------------------|------------------------|
| W1 | H | A, B, C |
| W2 | H | A, B, C |
| W3 | L | A, B, C |
| W4 | L | A, B, C |
| W5 | L | A, B, C |

FIG. 4

| WORKER No. | WORKING STATE | CURRENT POSITION | ASSIGNED WORK | SCHEDULED STARTING TIME OF ASSIGNED WORK | SCHEDULED FINISHING TIME OF ASSIGNED WORK | WORK FINISHING POSITION | TEMPORARILY ASSIGNED WORK | WORKER INTENTION | TOTAL TIME OF ACTUAL WORKS | FINISHING TIME OF PREVIOUS WORK |
|---------------|------------------|---------------------|---------------|--|---|-------------------------------|---------------------------------|---------------------|-------------------------------------|--|
| W1 | WAITING | A | | | | A | (N7) | (Y) | 63 MIN | 13:42:20 |
| W2 | WAITING | C | | | | C | (N7) | (Y) | 66 MIN | 13:51:10 |
| W3 | WAITING | A | N3, N6 | 14:00:10 | 14:03:30 | A | | | 224 MIN | 13:55:40 |
| W4 | WAITING | B | N2 | 14:00:40 | 14:02:40 | B | | | 231 MIN | 13:57:20 |
| W5 | WORKING | C | N1, N4, N5 | 13:59:20 | 14:03:40 | C | | | 228 MIN | 13:56:50 |

FIG. 5

| WORK- OBJECT CODE | WORK NAME | PRIORITY- ORDER TIME | RECOM- MENDED ARRIVAL TIME | MATERIAL SHORTAGE TIME | STANDARD NEEDED TIME | MATERIAL CODE | NEEDED SKILL LEVEL | RESPONSIBLE WORKER | NEAR CONTINUOUS WORK |
|-------------------------|-----------------------------|----------------------------|-------------------------------------|------------------------------|----------------------------|------------------|--------------------------|-----------------------|----------------------------|
| N1 C-XY-507 | REEL REPLACEMENT | 14:01:20 | 14:00:20 | 14:02:20 | 40 | C-416 | L | W5 | 2 |
| N2 B-XY-315 | FEEDER REPLACEMENT XY | 14:01:40 | 14:01:40 | 14:02:10 | 60 | I-266 | L | W4 | 0 |
| N3 A-XY-306 | REEL REPLACEMENT | 14:02:10 | 14:01:10 | 14:03:10 | 40 | C-556 | L | W3 | 1 |
| N4 C-XY-102 | REEL REPLACEMENT | 14:02:30 | 14:01:30 | 14:03:30 | 40 | C-492 | L | W5 | N1 |
| N5 C-XY-411 | FEEDER REPLACEMENT XY | 14:02:40 | 14:02:40 | 14:03:10 | 60 | P-646 | L | W5 | N1 |
| N6 A-RO-116 | FEEDER REPLACEMENT RO | 14:04:00 | 14:03:00 | 14:03:00 | 30 | C-376 | L | W3 | N3 |
| N7 B-PR-CH | SOLDER SUPPLY | 14:04:30 | 14:04:30 | 14:05:00 | 180 | CH-08 | H | (W1) | (0) |
| N8 C-XY-213 | FEEDER REPLACEMENT XY | 14:05:40 | 14:05:40 | 14:06:10 | 60 | I-461 | L | (W5) | (1) |
| N9 B-XY-504 | REEL REPLACEMENT | 14:05:50 | 14:04:50 | 14:06:50 | 40 | C-496 | L | (W4) | (1) |
| N10 B-XY-607 | REEL REPLACEMENT | 14:06:50 | 14:05:50 | 14:07:50 | 40 | P-752 | L | (W4) | (N9) |
| N11 A-DI-GL1 | SPRINGE REPLACEMENT | 14:07:00 | 14:07:00 | 14:07:30 | 150 | GL-60 | L | (W3) | (0) |
| N12 C-RO-205 | FEEDER REPLACEMENT RO | 14:08:00 | 14:07:00 | 14:07:00 | 30 | C-256 | L | (W5) | (N8) |
| N13 A-XY-612 | FEEDER REPLACEMENT XY | 14:08:00 | 14:08:00 | 14:08:30 | 60 | T-615 | L | (W4) | (1) |
| N14 C-PR-CH | SOLDER SUPPLY | 14:09:10 | 14:09:10 | 14:09:40 | 180 | CH-08 | H | (W2) | (0) |
| N15 A-XY-203 | REEL REPLACEMENT | 14:10:20 | 14:09:20 | 14:11:20 | 40 | T-344 | L | (W4) | (N13) |

FIG.6

| WORK ID | WORK- OBJECT CODE | WORK NAME | URGENCY DEGREE | OCCURRENCE TIME | STANDARD NEEDED TIME | REPLACEMENT- COMPONENT CODE | RESPONSIBLE WORKER | SIMULTANEOUS WORK |
|---------|-------------------|--------------------|----------------|-----------------|----------------------|-----------------------------|--------------------|-------------------|
| E1 | C-XY-4N3 | NOZZLE REPLACEMENT | L | 14:00:10 | 60 | NX12 | (W2) | (N5) |

FIG.7

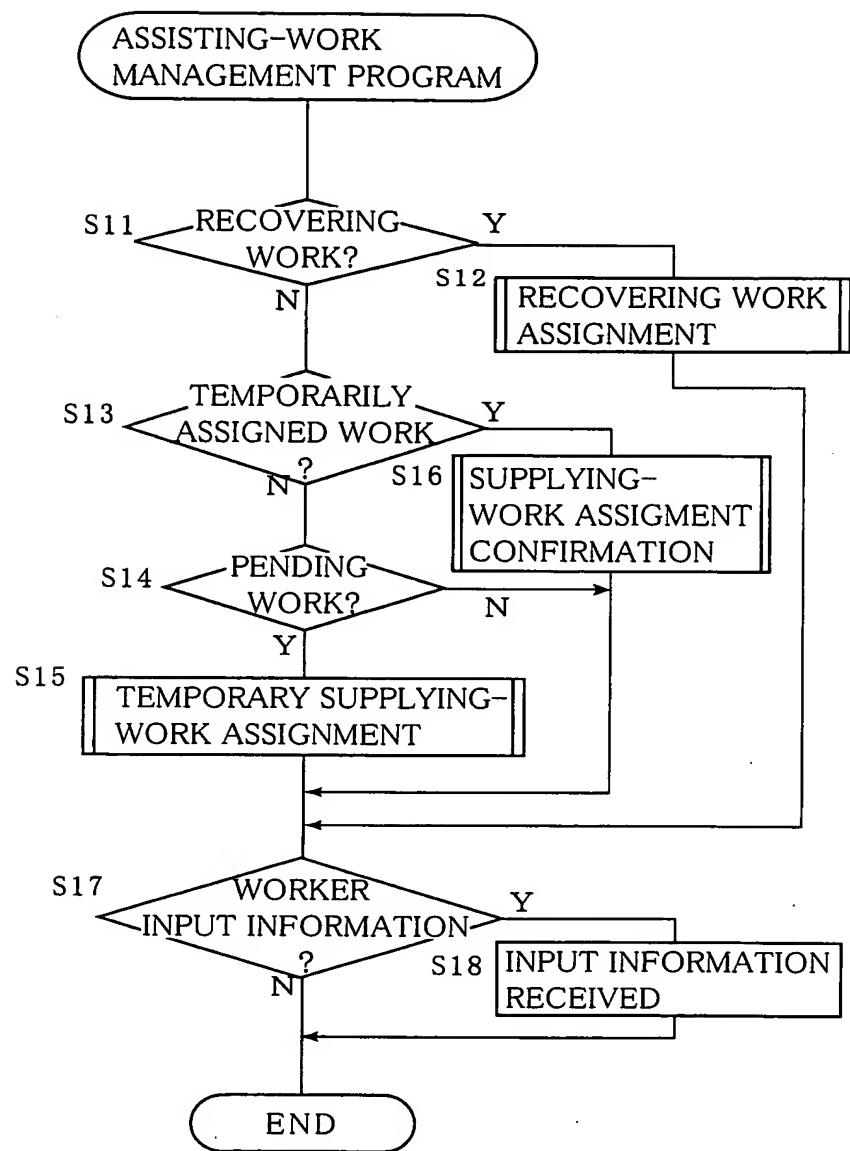


FIG.8

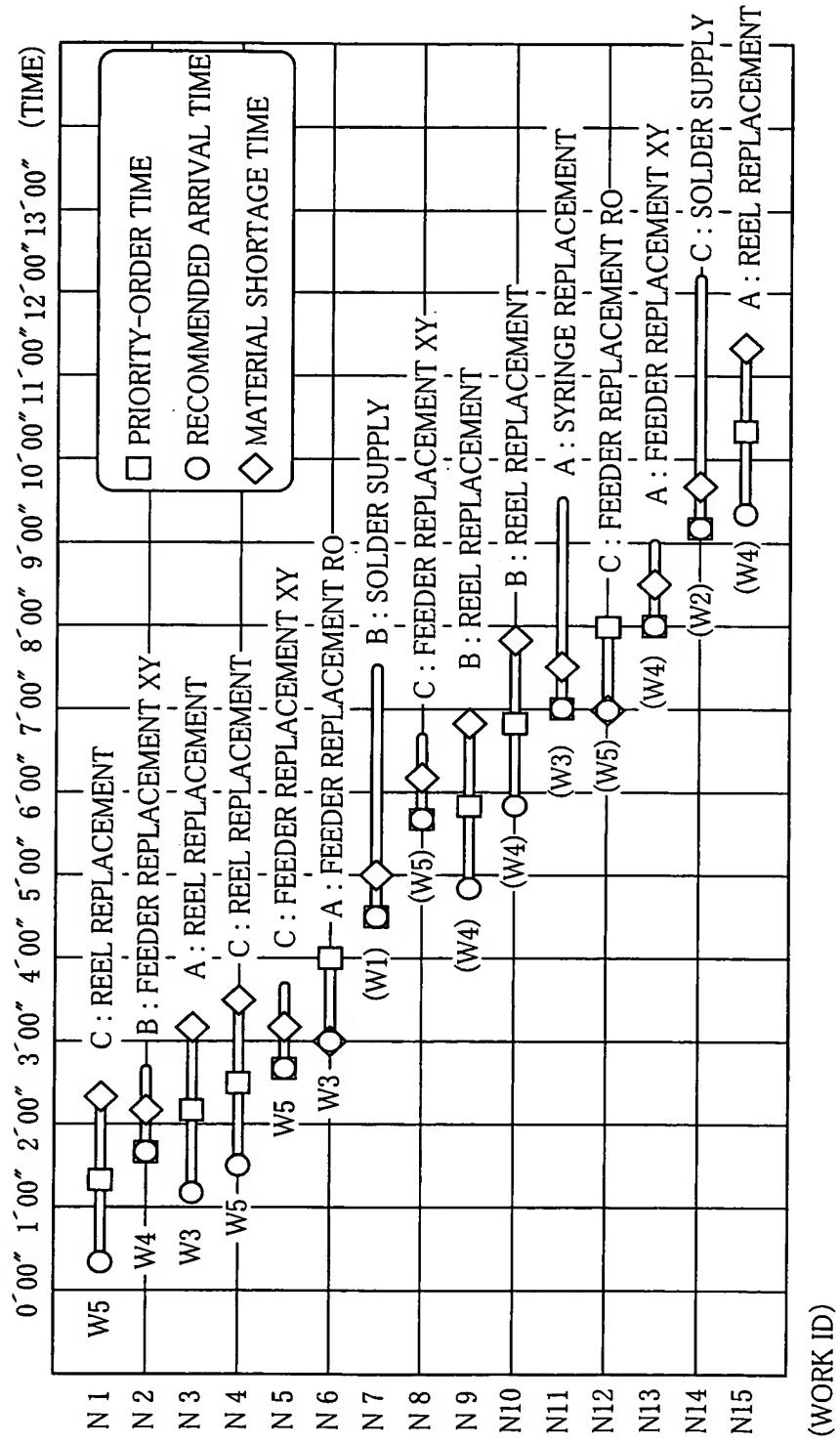


FIG.9

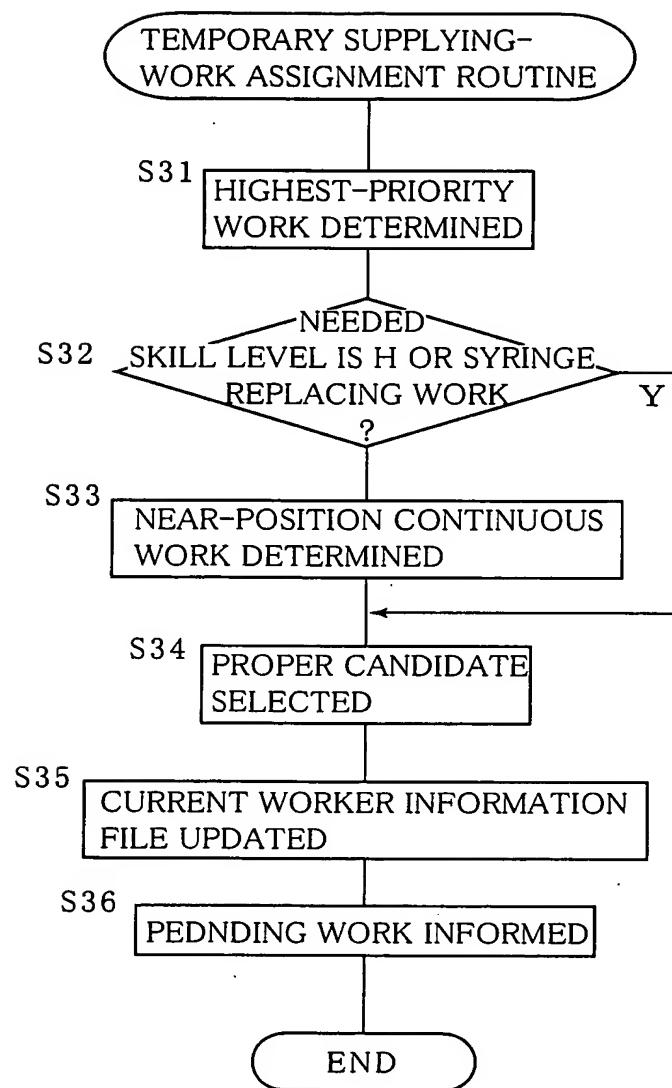


FIG.10

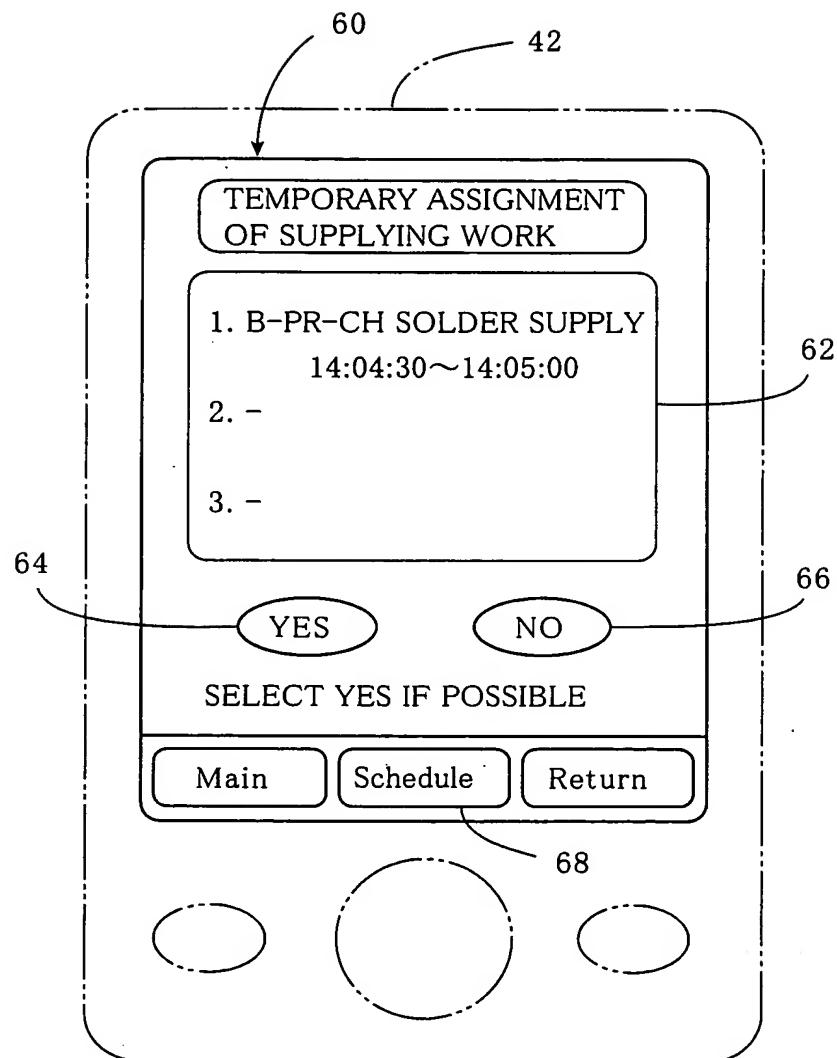


FIG.11

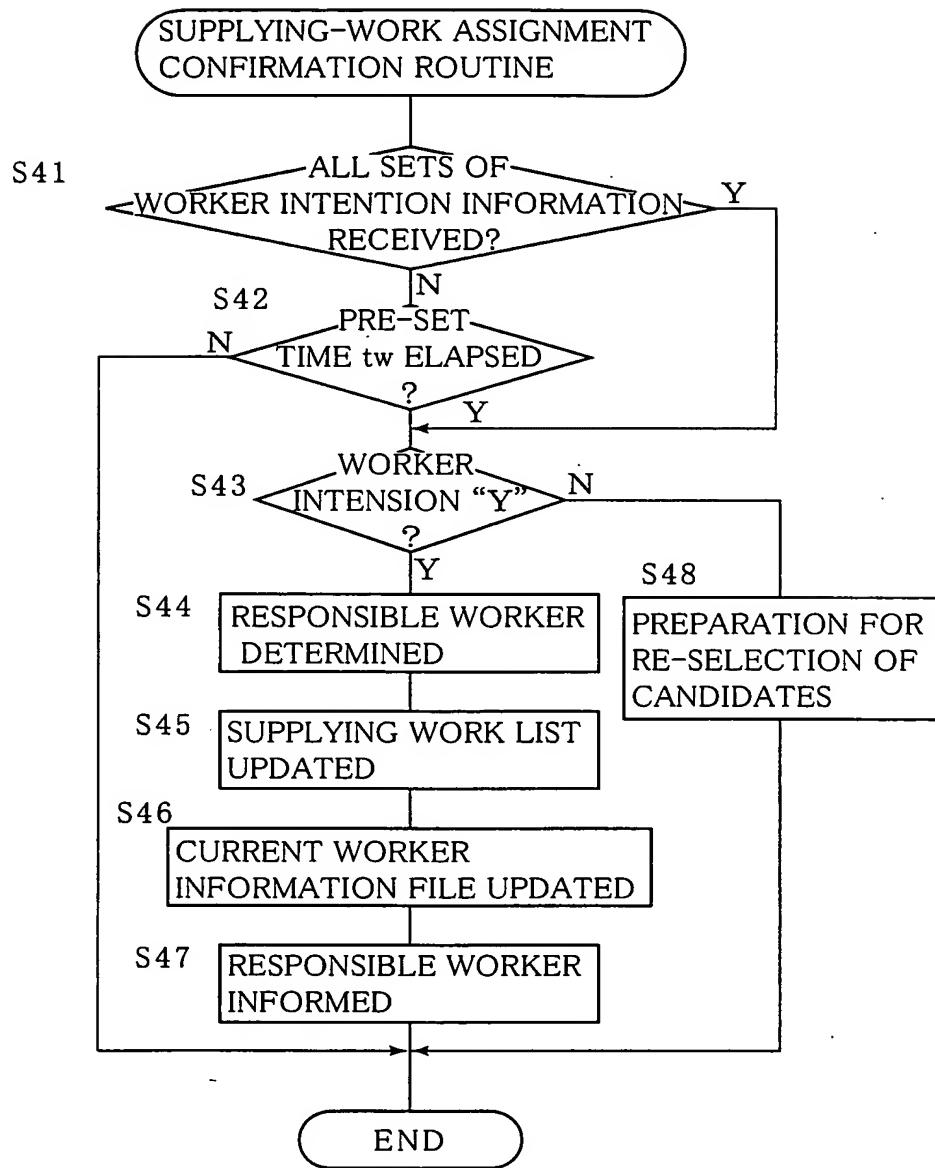


FIG. 12

| WORKER No. | WORKING STATE | CURRENT POSITION | ASSIGNED WORK | SCHEDULED STARTING TIME OF ASSIGNED WORK | SCHEDULED FINISHING TIME OF ASSIGNED WORK | WORK FINISHING POSITION | TEMPORARILY ASSIGNED WORK | WORKER INTENTION | TOTAL TIME OF ACTUAL WORKS | FINISHING TIME OF PREVIOUS WORK |
|---------------|------------------|---------------------|---------------|--|---|-------------------------------|---------------------------------|---------------------|-------------------------------------|--|
| W1 | WAITING | A | N7 | 14:04:30 | 14:07:30 | B | | | 63 MIN | 13:42:20 |
| W2 | WAITING | C | | | | C | | | 66 MIN | 13:51:10 |
| W3 | WORKING | A | N3, N6 | 14:00:10 | 14:03:30 | A | | | 224 MIN | 13:55:40 |
| W4 | WAITING | B | N2 | 14:00:40 | 14:02:40 | B | | | 231 MIN | 13:57:20 |
| W5 | WAITING | C | N4, N5 | 14:01:30 | 14:03:40 | C | (N8) | (Y) | 230 MIN | 14:01:00 |

FIG.13

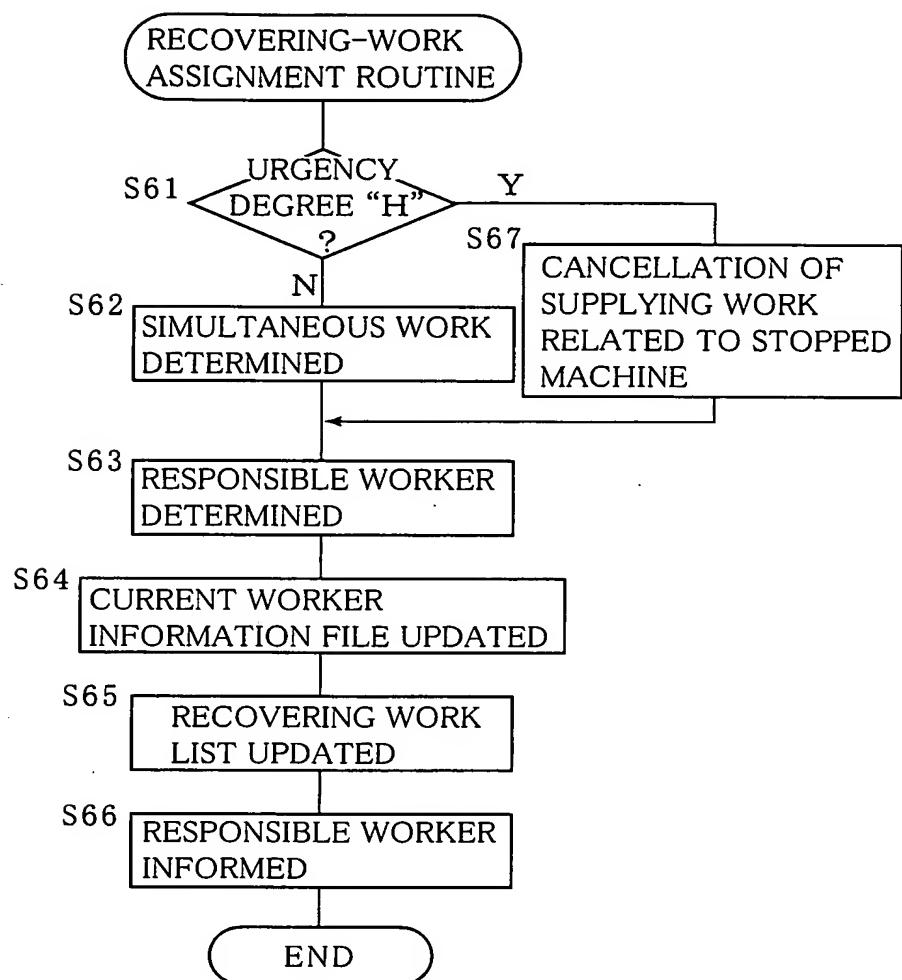


FIG. 14

| WORK ID | WORK- OBJECT CODE | WORK NAME | URGENCY DEGREE | OCCURRENCE TIME | STANDARD NEEDED TIME | REPLACEMENT- COMPONENT CODE | RESPONSIBLE WORKER | SIMULTANEOUS WORK |
|---------|-------------------|---|----------------|-----------------|----------------------|-----------------------------|--------------------|-------------------|
| E2 | C-RO-PC | IMAGE- RECOGNITION- CONDITION- ADJUSTMENT | H | 14:04:20 | 300 | | (W2) | |

FIG. 15

| WORKER No. | WORKING STATE | CURRENT POSITION | CURRENT ASSIGNED WORK | SCHEDULED STARTING TIME OF ASSIGNED WORK | SCHEDULED FINISHING TIME OF ASSIGNED WORK | WORK FINISHING POSITION | TEMPORARILY ASSIGNED WORK | WORKER INTENTION | TOTAL TIME OF ACTUAL WORKS | FINISHING TIME OF PREVIOUS WORK |
|------------|---------------|------------------|-----------------------|--|---|-------------------------|---------------------------|------------------|----------------------------|---------------------------------|
| W1 | WAITING | B | | | | B | | | 63 MIN | 13:42:20 |
| W2 | WAITING | C | E1 | 14:02:40 | 14:03:40 | C | | | 66 MIN | 13:51:10 |
| W3 | WAITING | A | N3, N6 | 14:00:10 | 14:03:30 | A | | | 224 MIN | 13:55:40 |
| W4 | WAITING | B | N2 | 14:00:40 | 14:02:40 | B | | | 231 MIN | 13:57:20 |
| W5 | WAITING | C | N1, N4, N5 | 13:59:20 | 14:03:40 | C | | | 228 MIN | 13:56:50 |

FIG. 16

| WORKER No. | WORKING STATE | CURRENT POSITION | CURRENT ASSIGNED WORK | SCHEDULED STARTING TIME OF ASSIGNED WORK | SCHEDULED FINISHING TIME OF ASSIGNED WORK | WORK FINISHING POSITION | TEMPORARILY ASSIGNED WORK | WORKER INTENTION | TOTAL TIME OF ACTUAL WORKS | FINISHING TIME OF PREVIOUS WORK |
|------------|---------------|------------------|-----------------------|--|---|-------------------------|---------------------------|------------------|----------------------------|---------------------------------|
| W1 | WAITING | B | N7 | 14:04:30 | 14:07:30 | B | | | 63 MIN | 13:42:20 |
| W2 | WAITING | C | | | | C | | | 67 MIN | 14:03:40 |
| W3 | WAITING | A | N11 | 14:07:00 | 14:09:30 | A | | | 226 MIN | 14:03:30 |
| W4 | WAITING | B | N9, N10, N13, N15 | 14:03:50 | 14:10:00 | B | | | 233 MIN | 14:02:40 |
| W5 | WAITING | C | N8, N12 | 14:04:40 | 14:07:30 | C | | | 232 MIN | 14:03:40 |

FIG. 17

